

No. 813,299.

PATENTED FEB. 20, 1906.

D. HUG.
WATER WHEEL.

MODEL.

APPLICATION FILED MAR. 29, 1902.

Fig. 1.

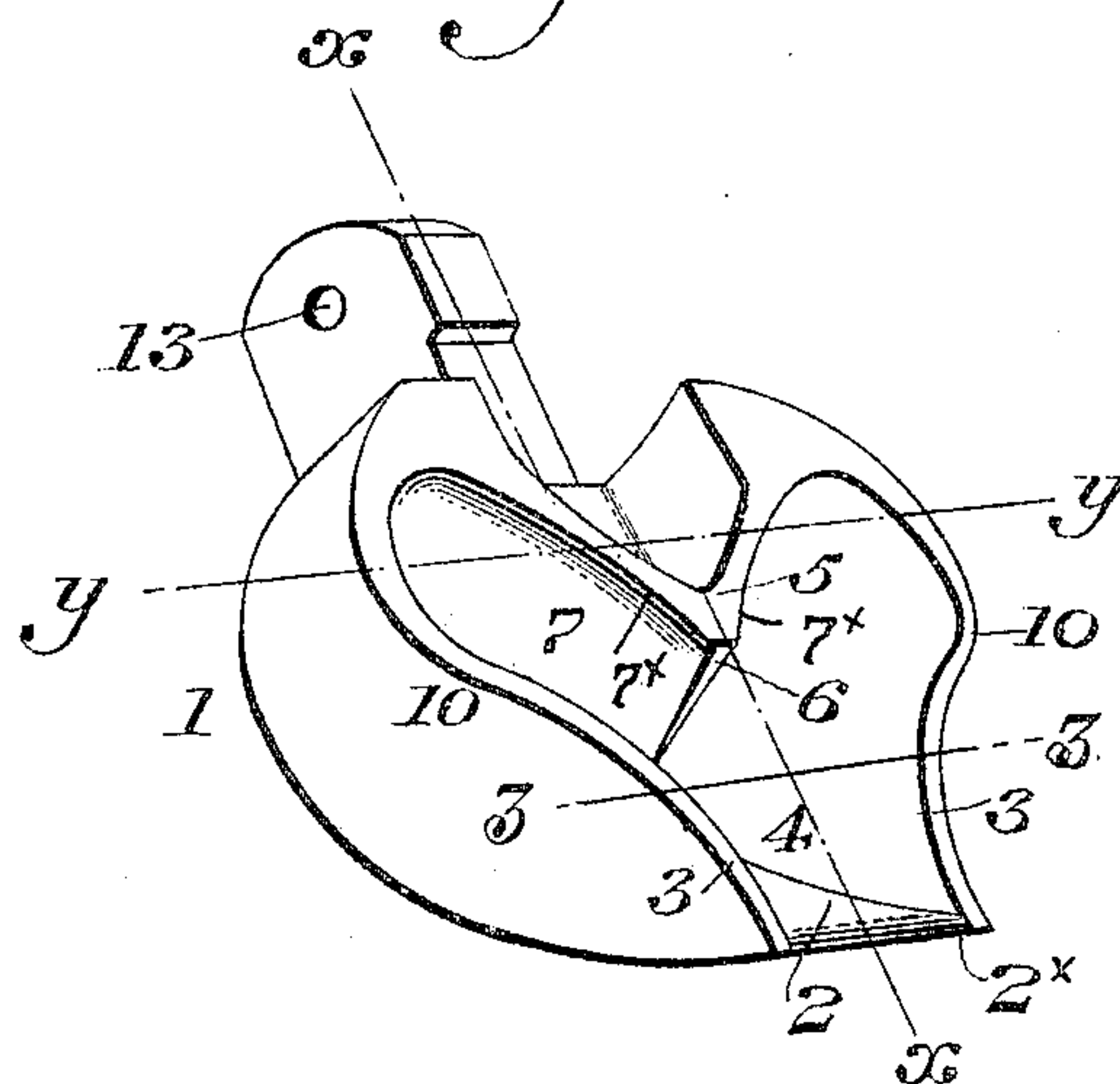


Fig. 2.

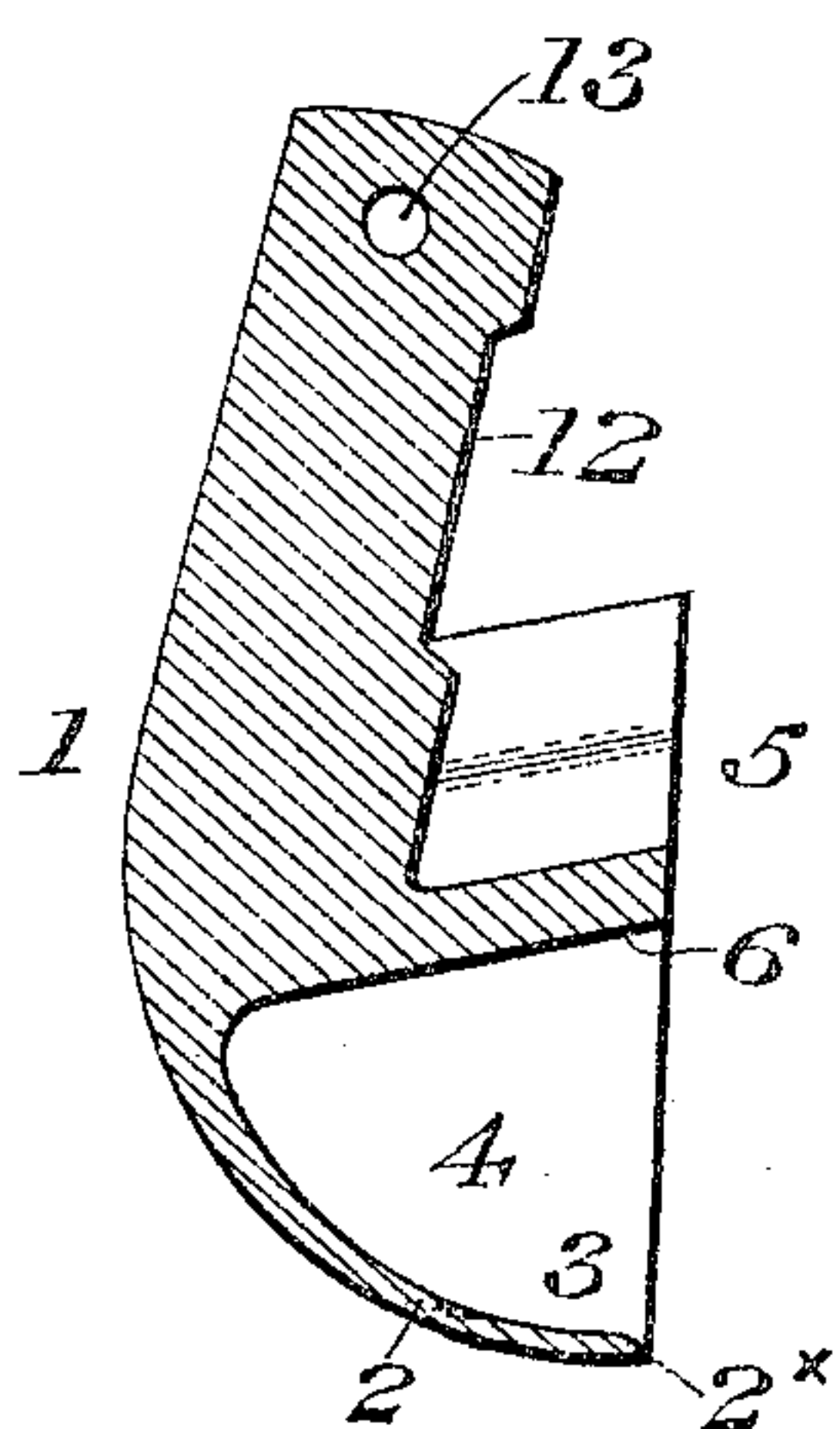


Fig. 3.

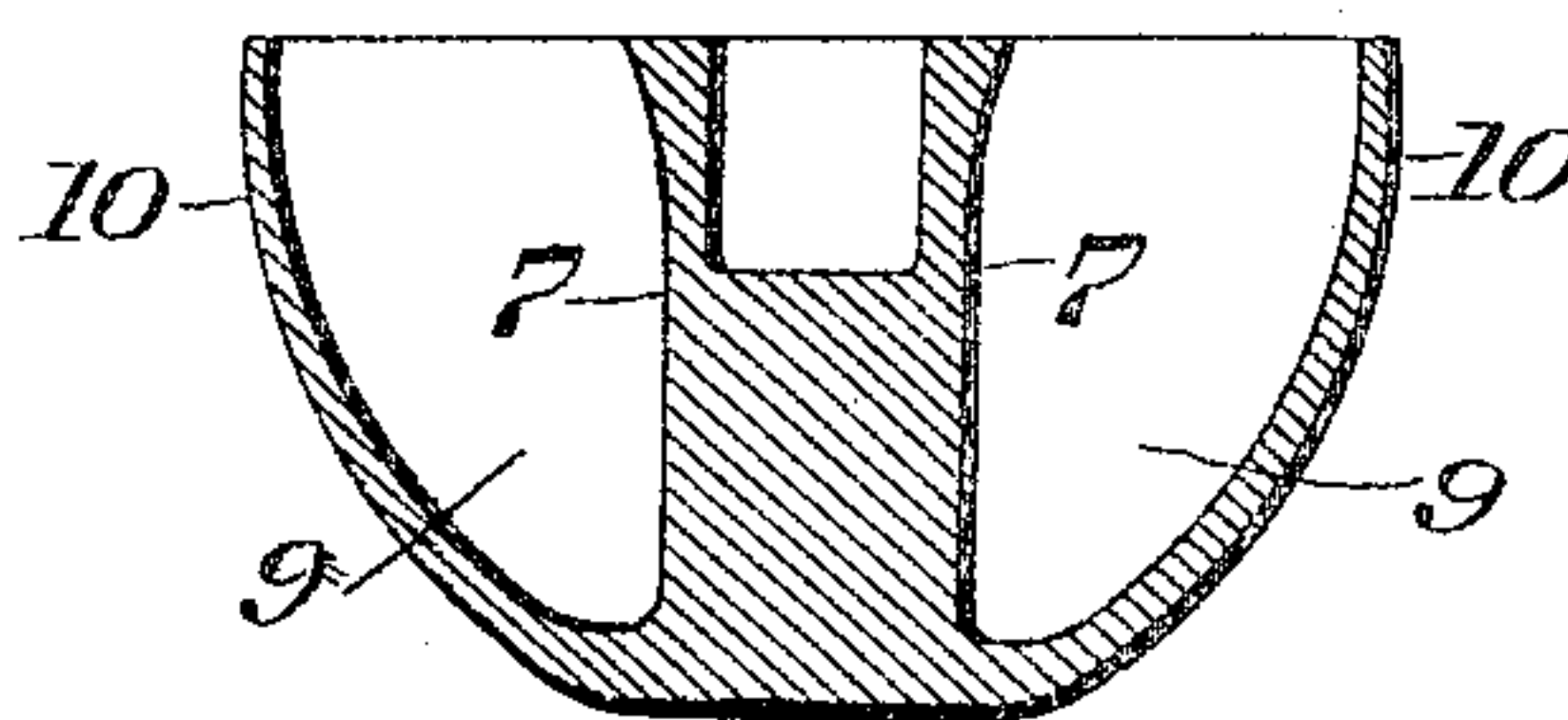
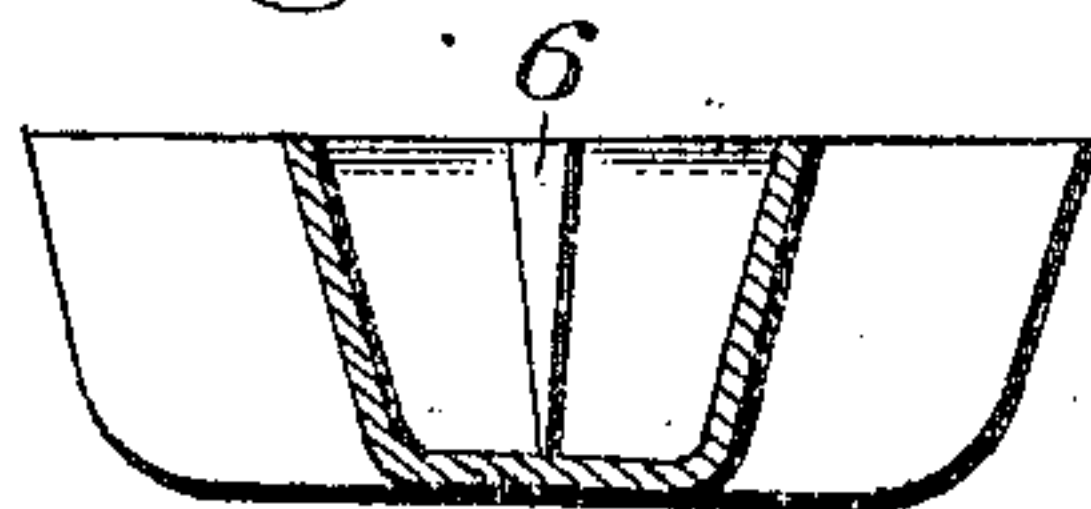


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

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WATER-WHEEL.

No. 813,299.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed March 29, 1902. Serial No. 100,643. (Model.)

To all whom it may concern:

Be it known that I, DANIEL HUG, a citizen of the United States, residing in the city of Denver, county of Arapahoe, State of Colorado, have invented a new and useful Improvement in Water-Wheels, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to water-wheels; and it consists more especially in an improved construction of bucket therefor whereby friction is reduced to a minimum and the water is discharged from each bucket without tending to impair the efficiency of the wheel, provision being made for dividing the incoming stream of water or other fluid and causing the same to be discharged through diverging chambers of a novel construction.

The present invention is designed more especially as an improvement upon the construction shown in the Patent No. 576,849, granted to me February 9, 1897. By my present improvement I am enabled to obtain an efficiency of as high as ninety-four per cent. In the present construction the deepest part of the bucket is proportionately very much deeper. It is narrower at the lip and much wider at the widest part. The vertical apex (starting at the lip) is done away with, and the V-shaped wall is longer, reaching nearer down to the lip than in the old construction. The chambers are constructed so as to return the liquid parallel with the ingoing stream; yet instead of contracting the outlet at the face the chambers are largest at such point.

It also consists in the novel proportions and arrangements of chambers and passages in a bucket whereby the greatest efficiency is secured.

It further consists of novel details of construction, all as will be hereinafter fully set forth, and specifically pointed out in the claim.

Figure 1 represents in perspective a water-wheel bucket embodying my invention. Figs. 2, 3, and 4 are vertical sections on the line xx , yy , and zz , respectively, Fig. 1.

Similar characters of reference indicate corresponding parts in the several figures.

Referring to the drawings, 1 designates a bucket, the same consisting of the curved rear wall or lip 2, upon which the impinging fluid is first received, said wall being provided at its lower extremity with the sharp edge 2^x and having the inclined walls 3,

whereby a chamber 4 is formed, into which the incoming fluid is initially received.

5 designates a V-shaped wall or frog, which is located in substantially the center of the bucket over the chamber 4 and has the apex 6, Fig. 1 and Fig. 2, whereby the incoming fluid is divided into two streams after entering the chamber 4.

7 designates the outwardly-diverging and overhanging walls of the frog 5, whereby a chamber 9 is formed between the inner wall 7 at each side of said frog and the flaring exterior sides 10, the location of the said inner wall 7 of the chambers 9 being best seen in Figs. 1 and 3, the discharge of fluid from the chambers 9 being directed by the curved and flaring outer walls 10 and the overhanging inner walls 7. It is found in practice that these discharge the water at both sides of the wheel with a minimum of friction and no back pressure.

12 designates a tenon projecting upwardly from the body of the bucket and provided with an opening 13 therein for reception of a key.

The operation is as follows: The incoming fluid impinges first upon the rear wall 2 of the chamber 4 and is deflected upwardly against the apex 6, whereby it is divided and passes into the chambers 9, it being understood that the receiving-chamber 4 and the discharge-chambers 9 are of approximately equal depth, that the apex 6 of the frog 5 is slightly inclined from the perpendicular, and that the reverse curvature of the walls 3 and 10 permits the passage of the water through the bucket with the least possible resistance.

The edges 7^x of the frog 5 are preferably sharp. The lower wall of the receiving-chamber is curved from its edge to the front of the frog, so that the bucket receives the water on the inclined faces from first to last and the water is returned without flare parallel with the ingoing stream. The point of the frog 5 is substantially the same distance above the lip or edge 2^x as is the greatest depth of the bucket. The height of the bucket from the lower edge 2^x to the top of the chambers 9 is nearly twice that of the point of the frog 5 above said edge. These proportions are for my standard bucket, and while the general shape will be the same I wish to retain the right to alter them so as to meet the requirements of different heads (pressures.)

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

A bucket for impact water-wheels comprising side cavities and a central frog, the
5 upper edges of the frog being overhung and the front edge or apex thereof being straight, rising from about the middle of the floor of the bucket, and being inclined slightly backward, the floor of the bucket inclining upwardly and forwardly from the bottom point
10 of the frog to a horizontal straight lip, said

upwardly-inclining portion being bounded by the side walls of the bucket, the side walls extending backwardly from the lip each in reverse curves and merging with the frog, the
15 upper surfaces of the frog and side walls and the lip being in the same plane.

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Witnesses:

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